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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,136	10/31/2003	Tadashi Shiraishi	F-8019	3465
28107 7590 10/17/2007 JORDAN AND HAMBURG LLP 122 EAST 42ND STREET SUITE 4000 NEW YORK, NY 10168			EXAMINER CARRILLO, BIBI SHARIDAN	
			ART UNIT 1792	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/699,136

Applicant(s)

SHIRAISHI

Examiner

Sharidan Carrillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 6-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the disconnecting the heat transfer medium feeding pipe and a heat transfer medium discharging pipe from said inlet and said outlet must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. It should be noted that page 7, lines 1-5 of the specification specifically states that the feeding pipe and the discharging pipe are not shown in the drawing.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a

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later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 7, 9, 11, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barry (42724007) in view of Sameshima (JP01-028625) and further in view of Withers Jr (4007774).

Barry teaches a method of cleaning pipes and tubes, in heat exchangers, using ice in combination with water (Abstract, col. 2, lines 60-65, col. 4, lines 25-45). Barry fails to teach the limitations of connecting the suction hose to the pipe and suction pump, connecting the ice-feeding hose to the pipe and supplying ice and water from the hopper into the pipe.

Sameshima teaches flushing a pipe using a carriage 1 with a suction pipe mounted thereon and waste water collecting tank 2 (Fig. 1, page 3). On page 5, Sameshima teaches cleaning with ice water until clean water flushes into the waste water collecting tank. Ice water enters port 12 and is suction pumped through the branch pipe and waste is collected in tank 2. On page 6, Sameshima teaches using the method for cleaning of a piping. Sameshima fails to teach cleaning heat exchangers.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Barry to include using a suction hose and pump in connection with the pipe, in order to flush ice and water through the pipe, as taught by Sameshima, thereby cleaning the interior surface of the pipe of debris. In reference to the hopper, Barry et al. teach various magazines such as hoppers

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(Fig. 11), for storing ice particles and further transporting the pipe in the piping for cleaning. Additionally, it is conventional in the art to use hoppers for the generation and storage of ice particles (US5934566).

Barry in view of Sameshima fail to teach the limitations directed to the principle of reverse-flow. The limitations of claims 25-26 are directed to reverse-flow as well. Withers Jr. teaches cleaning heat exchanger tubes by periodically reversing the fluid flow in order to remove coating deposits. It would have been obvious to a person of ordinary skill in the art to modify the method of Barry to include reverse flow, as taught by Withers, for purposes of effectively removing contaminants from the interior surface of the heat exchanger tubes. Additionally, the concept of enhanced cleaning by reverse flow is notoriously well known and conventionally practiced in the art (Thomas, 4,054,150; Edstrand et al. 5,680,877).

Barry in view of Sameshima and Withers Jr fail to teach a transparent portion of the ice feeding hose, as recited in claim 7. However, it would have been within the level of the skilled artisan to modify the method of Barry et al. to include a transparent hose since Barry teaches the need to detect the completion of the cleaning cycle by observing whether ice flows into the waste water collecting tank at a faster velocity. In reference to claim 9, it would have been within the level of the skilled artisan to adjust the ratio of ice to water in order to form an effective composition which would be easily flowable, yet effective for scrubbing the interior surface of the pipe. In reference to claim 11, Barry et al., (col. 3, lines 35-40) teaches that the diameter of the pig is selected to

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permit it to penetrate the lumen of the contaminated tube. Given the teachings of Barry et al, it would have been well within the level of the skilled artisan to modify the size of the ice cube depending upon the diameter of the heat exchange tubing being cleaned and the amount of contaminants present therein. In reference to claim 27, refer to Fig. 1 of Barry which illustrates the coil pipe 11 is non-corrugated.

6. Claims 6, 8, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barry (42724007) in view of Sameshima (JP01-028625) and further in view of Withers Jr (4007774) and further in view of Leon et al. (4327560).

Barry teaches a method of cleaning pipes and tubes, in heat exchangers, using ice in combination with water (Abstract, col. 2, lines 60-65, col. 4, lines 25-45). Barry fails to teach the limitations of connecting the suction hose to the pipe and suction pump, connecting the ice-feeding hose to the pipe and supplying ice and water from the hopper into the pipe.

Sameshima teaches flushing a pipe using a carriage 1 with a suction pipe mounted thereon and waste water collecting tank 2 (Fig. 1, page 3). On page 5, Sameshima teaches cleaning with ice water until clean water flushes into the waste water collecting tank. Ice water enters port 12 and is suction pumped through the branch pipe and waste is collected in tank 2. On page 6, Sameshima teaches using the method for cleaning of a piping. Sameshima fails to teach cleaning heat exchangers.

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It would have been obvious to a person of ordinary skill in the art to have modified the method of Barry to include using a suction hose and pump in connection with the pipe, in order to flush ice and water through the pipe, as taught by Sameshima, thereby cleaning the interior surface of the pipe of debris. In reference to the hopper, Barry et al. teach various magazines such as hoppers (Fig. 11), for storing ice particles and further transporting the pipe in the piping for cleaning. Additionally, it is conventional in the art to use hoppers for the generation and storage of ice particles (US5934566).

Barry in view of Sameshima fail to teach the limitations directed to the principle of reverse-flow. Withers Jr. teaches cleaning heat exchanger tubes by periodically reversing the fluid flow in order to remove coating deposits. It would have been obvious to a person of ordinary skill in the art to modify the method of Barry to include reverse flow, as taught by Withers, for purposes of effectively removing contaminants from the interior surface of the heat exchanger tubes. Additionally, the concept of enhanced cleaning by reverse flow is notoriously well known and conventionally practiced in the art (Thomas, 4,054,150; Edstrand et al. 5,680,877).

Barry in view of Sameshima and Withers fail to teach a copper coil pipe. Leon teaches that it is well known in the art that heat exchangers are conventionally made of copper coils (col. 1, lines 43-45). Therefore, it would have been within the level of the skilled artisan to clean copper coil piping since Barry teaches heat exchangers and heat exchangers are typically made of copper coil piping.



Barry in view of Sameshima and Withers Jr fail to teach a transparent portion of the ice feeding hose, as recited in claim 8. However, it would have been within the level of the skilled artisan to modify the method of Barry et al. to include a transparent hose since Barry teaches the need to detect the completion of the cleaning cycle by observing whether ice flows into the waste water collecting tank at a faster velocity. In reference to claim 10, it would have been within the level of the skilled artisan to adjust the ratio of ice to water in order to form an effective composition which would be easily flowable, yet effective for scrubbing the interior surface of the pipe. In reference to claim 12, Barry et al., (col. 3, lines 35-40) teaches that the diameter of the pig is selected to permit it to penetrate the lumen of the contaminated tube. Given the teachings of Barry et al, it would have been well within the level of the skilled artisan to modify the size of the ice cube depending upon the diameter of the heat exchange tubing being cleaned and the amount of contaminants present therein.

7. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barry (42724007) in view of Sameshima (JP01-028625) and further in view of Williams Jr. (5499639).

Barry teaches a method of cleaning pipes and tubes, in heat exchangers, using ice in combination with water (Abstract, col. 2, lines 60-65, col. 4, lines 25-45). Col. 5, lines 19-35 teach cleaning multiple tubes. Barry fails to teach the limitations of connecting the suction hose to the pipe and suction pump, connecting the ice-feeding hose to the pipe and supplying ice and water from the hopper into the pipe. In reference to simultaneously cleaning a plurality of coil

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pipes, col. 5, lines 19-35 teaches that the method of Barry can be used to sequentially clean each tube or simultaneously clean a selected number of tubes.

Sameshima teaches flushing a pipe using a carriage 1 with a suction pipe mounted thereon and waste water collecting tank 2 (Fig. 1, page 3). On page 5, Sameshima teaches cleaning with ice water until clean water flushes into the waste water collecting tank. Ice water enters port 12 and is suction pumped through the branch pipe and waste is collected in tank 2. On page 6, Sameshima teaches using the method for cleaning of a piping. Sameshima fails to teach cleaning heat exchangers.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Barry to include using a suction hose and pump in connection with the pipe, in order to flush ice and water through the pipe, as taught by Sameshima, thereby cleaning the interior surface of the pipe of debris. In reference to the hopper, Barry et al. teach various magazines such as hoppers (Fig. 11), for storing ice particles and further transporting the pipe in the piping for cleaning. Additionally, it is conventional in the art to use hoppers for the generation and storage of ice particles (US5934566).

Barry in view of Sameshima fails to teach the first and second headers of the heat exchangers, as recited in claim 13. Williams teaches that it is well known and conventional for heat-exchangers to have inlet and outlet headers 24, 32, to provide communication between the plurality of tubes and manifold chamber. Williams further teaches applying a fluid media comprising a cleaning

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solid to each one of the headers to clean the heat exchanger (col. 3, lines 10-23, lines 55-60). It would have been obvious to the skilled artisan to have modified the method of Barry to include headers, since Williams teaches that headers are conventionally used in heat exchangers to communicate the tubes to the manifold chamber and further teaches headers which serve as inlet and outlets for delivery of the cleaning media.

In reference to claims 14-16, refer the teachings of Williams. Additionally, it would have been within the level of the skilled artisan to repeat the cleaning process in order to further remove contaminants and to achieve a desired level of cleanliness within the interior of the tubing. In reference to claim 17, refer to Fig. 1 of Barry which illustrates the coil pipe 11 are non-corrugated.

8. Claims 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barry (42724007) in view of Sameshima (JP01-028625)

Barry teaches a method of cleaning pipes and tubes, in heat exchangers, using ice in combination with water (Abstract, col. 2, lines 60-65, col. 4, lines 25-45). Re claims 18 and 22, Barry fails to teach the limitations of connecting the suction hose to the pipe and suction pump, connecting the ice-feeding hose to the pipe and supplying ice and water from the hopper into the pipe.

Sameshima teaches flushing a pipe using a carriage 1 with a suction pipe mounted thereon and waste water collecting tank 2 (Fig. 1, page 3). On page 5, Sameshima teaches cleaning with ice water until clean water flushes into the waste water collecting tank. Ice water enters port 12 and is suction pumped through the branch pipe and waste is collected in tank 2. On page 6,

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Sameshima teaches using the method for cleaning of a piping. Sameshima fails to teach cleaning heat exchangers.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Barry to include using a suction hose and pump in connection with the pipe, in order to flush ice and water through the pipe, as taught by Sameshima, thereby cleaning the interior surface of the pipe of debris. In reference to the hopper, Barry et al. teach various magazines such as hoppers (Fig. 11), for storing ice particles and further transporting the pipe in the piping for cleaning. Additionally, it is conventional in the art to use hoppers for the generation and storage of ice particles (US5934566).

Barry in view of Sameshima fail to teach a transparent portion of the ice feeding hose, as recited in claim 19. However, it would have been within the level of the skilled artisan to modify the method of Barry et al. to include a transparent hose since Barry teaches the need to detect the completion of the cleaning cycle by observing whether ice flows into the waste water collecting tank at a faster velocity. In reference to claim 20, it would have been within the level of the skilled artisan to adjust the ratio of ice to water in order to form an effective composition which would be easily flowable, yet effective for scrubbing the interior surface of the pipe. In reference to claim 21, Barry et al., (col. 3, lines 35-40) teaches that the diameter of the pig is selected to permit it to penetrate the lumen of the contaminated tube. Given the teachings of Barry et al, it would have been well within the level of the skilled artisan to modify the size of the ice cube depending upon the diameter of the heat exchange tubing being cleaned

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and the amount of contaminants present therein. Re claim 23, and based on the embodiment of Fig. 2 of Barry et al., the pipes of the heat exchanger are disconnected since Barry et al. clearly shows the heat exchanger being inoperable and isolated such that the ice particles (Figs. 4 and 13) can be launched to clean the inside of the tube bundles. Re claim 24, Barry specifically teaches a hopper for holding ice pigs 114 which are launched to clean the interior of the heat exchanger. In reference to the suction connected to the outlet, refer to the teachings of Sameshima.

### ***Response to Arguments***

9. Applicant has provided 19 pages of arguments, most of the arguments, if not all are a duplication of arguments filed previously on 11/27/2006. Pages 12-13 of applicant's response of 7/30/2007 correspond to pages 12-13 of Applicant's response of 11/27/2006. Pages 14-19 of applicant's current response correspond of pages 14-19 of applicant's response of 11/27/2006. Page 20 of applicant's response is a repeat of arguments presented on page 15 applicant's same response of 7/30/07. Page 21 is a repeat of the same arguments presented on pages 12-14 of applicant's same response of 7/30/07. Page 22 is a repeat of pages 14-15 of applicant's response of 7/30/07. Page 23 is a repeat of arguments previously presented on page 16 of the same response. Pages 24-25 are a repeat of arguments presented previously on page 19 of the same response. Page 26-28 are a repeat of arguments presented on page 20+ of the

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response of 11/27/06. Therefore, the examiner will maintain the same arguments, as cited in the Final Office action, and as again presented below.

10. Applicant continues to argue that Barry et al. is limited to a pig of generally an inner pipe conforming size and therefore, its disclosure cannot be expanded to the speculative use of ice/water slurry by mere application of suction.

Applicant argues that Barry is limited to being loaded into a tube and pressure applied behind the projectile. Therefore, Barry cannot constitute as a proper reference. Applicant further argues that Barry clearly does not teach ice having a small enough diameter to be pulled into and through the tube by suction.

Applicant argues that Barry fails to teach using a pig of a smaller size in cleaning the heat exchanger tubes. Applicant's arguments are unpersuasive for the following reasons. Col. 11, lines 54-62, col. 12, lines 1-25 and claims 3 and 12 teach using a hopper type magazine in combination with ice pigs for cleaning the interior of heat exchangers. Col. 3, lines 55-57 teach using pigs of small clearance in the tube. Col. 4, lines 25-30 teaches using an ice pig and further teaches the pig in combination with water. Col. 4, lines 5-10 teaches that the pig is dimensioned to provide high velocity and travel in the tube propelled by the liquid. Therefore, since Barry teaches using ice/water and further teaches varying the pig dimension to fit the tube, a small pipe would require the use of a smaller pig, such as an ice/water mixture, which would have a smaller clearance. Additionally, col. 11, lines 55-65, col. 12, lines 1-24 and claims 3 and 12 of Barry et al. teach using a hopper in combination with ice to clean the heat exchanger. Additionally, any ice/water slurry mixture would meet the criteria of providing high

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velocity and the ability to travel in the tube propelled by liquid water. Further, it is notoriously well known in the art, as further evidenced by Sameshima, to clean pipes using ice/water slurry mixtures.

11. Applicant argues that the diameter of the pig, as taught by Barry, is selected to permit the pig to penetrate the lumen of the contaminated tube, and therefore the pig must conform to the size of the tubing. Applicant's arguments are not persuasive because the flow of an ice/water slurry mixture would certainly also penetrate the lumen of the contaminated tube.

12. Applicant further cites col. 3, lines 36-53 for support of using pigs with larger diameters. While it is true that Barry teaches using pigs of larger diameters, Barry also teaches that pigs of smaller diameters as well (col. 3, lines 55-57) and further teaches in col. 4, lines 5-10 that it is within the level of the skilled artisan to adjust the dimensions of the pig, provided the pig can travel in the tube at high velocity. Barry teaches adjusting the dimension of the pig depending upon the size of the tube.

13. Applicant argues that the ice pig may jam an oval tube and therefore it is undesirable to use an ice pig. Applicant argues that jamming of ice in the tubes is a recognized problem, and therefore, the skilled artisan would not use mere suction. Applicant's arguments are not persuasive because they are not commensurate in scope with the instantly claimed invention. Applicant is not claiming cleaning an oval tube. Additionally, Barry suggests cleaning tubes with ice/water. It is only with oval tube, that the pig "may" jam. The reference states

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that it "may" jam, suggesting that cleaning the oval tube with "ice/water" may not necessarily jam and if it does, it is not serious.

14. Applicant further argues that Barry teaches "that it is possible to machine such a pig to fit closely the particular dimensions of a tube to be cleaned".

Clearly Barry teaches that depending upon the size of the tubing to be cleaned, the dimensions of the pig are adjusted. A small tube may require a smaller size pig (i.e. ice/water slurry mixture) since all that is required is for the pig to be propelled by the liquid and travel with high velocity. Additionally, col. 4, lines 43 teach pigs can be spherical in shape, which would read on an ice/ slurry mixture.

15. Applicant argues that the pig of Barry et al. would require high pressures to keep it from jamming in the tube and therefore the skilled artisan would not use suction since suction requires lower pressures. Applicant's arguments are not persuasive since they are not commensurate in scope with the instantly claimed invention. Additionally, Barry teaches adjusting the pressure depending upon the particular application (col. 4, lines 45-50). Additionally, the higher pressures are only required because the pig is being launched. The skilled artisan would recognized the advantages of using a suction means as compared to a launcher since the former would require less equipment and easier to use. Applicant further argues that since Barry teaches a high pressure of 1000psi, there is no suggestion of using a lower pressure of 14.7 psi, corresponding to suction. Applicant's arguments are unpersuasive because they are not commensurate in scope with the instantly claimed invention. Further, Barry et al.



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clearly teach in col. 4, lines 48-52 that pressures of 1000psi are preferable and further teaches adjusting the pressure depending on the particular application.

16. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

17. Applicant argues that one skilled in the art would not have a reasonable expectation of success since Barry teaches using propelled pigs instead of suction as a driving means. Applicant argues that Barry cannot be modified to include the use of suction since it would be counterproductive and diametrically opposed to the pressure propelled method. The use of suction as a driving means would not be counterproductive since it serves as an alternative means for achieving the same purpose of cleaning the interior of the pipe. Additionally, the skilled artisan would recognize the advantages of using a suction means as compared to a launcher since the former would require less equipment and easier to use.

18. Applicant argues that there is no suggestion as to how the ice pigs could be automatically transferred from a hopper without outside intervention or assistance. Applicant's arguments are unpersuasive because they are not

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commensurate in scope with the instantly claimed invention. Additionally, Barry teaches using a hopper in which pigs may be fed into the launcher. The modification of Barry to include a suction means would result in the pigs being fed from the hopper into the tubing and further suctioned to remove contaminants therefrom. It is well known in the art, as evidenced by Fujii (JP58-3686) to deliver ice cubes directly from a container into the piping and abrasively cleaning the piping by applying a suction means.

19. Applicant further argues that there is no reasonable expectation of success since there is no indication that the same fouling agents present in the sewer and water lines will have the same characteristic as the heat exchangers. Applicant's arguments are unpersuasive because they are not commensurate in scope. Additionally, since both references teach cleaning the interior of the piping, one would reasonably expect the abrasive cleaning with ice cubes to remove contaminants present on the interior of the tube.

20. In reference to claims 13-17, Applicant argues that Barry fails to teach a method of cleaning tubes by simultaneous passage through at least two coil pipes. Applicant's arguments are unpersuasive since col. 5, lines 19-35 teaches that the method of Barry can be used to sequentially clean each tube or simultaneously clean a selected number of tubes.

Applicant further argues that there is no teaching of a hopper containing an ice/water mixture, which is connected to the header, suctioning the ice/water mixture into the header to clean simultaneously at least two coil pipes. Barry clearly teaches a hopper containing an ice/water mixture for cleaning

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simultaneously a plurality of tubing of a heat exchanger. The prior art of Sameshima teaches the use of suction to clean the interior of piping and the secondary reference of Williams teaches that it is well known and conventional for heat-exchangers to have inlet and outlet headers to provide communication between the plurality of tubes and manifold chamber. It would have been well within the level of the skilled artisan to connect the hopper to one of the headers in order to provide communication between the ice/water mixture and the heat exchanger such that the ice/water mixture flows simultaneously between a plurality of tubes to clean the interior surface.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W 6:30-4:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sharidan Carrillo  
Primary Examiner  
Art Unit 1792

bsc



SHARIDAN CARRILLO  
PRIMARY EXAMINER